

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN OR RELATING TO
SECURING ELONGATE MEMBERS TO
STRUCTURES, MORE ESPECIALLY IN
SURGICAL PROCEDURES

(71) We, HENRY VERNON CROCK and LJUBOMIR PERICIC, both Australian citizens, and both of Alcaston House, Suite 11, 5th Floor, 2 Collins Street, Melbourne 3000, Australia, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:-

This invention relates to securing devices and structures. Such devices and structures have application in correcting certain forms of physical deformity and in other surgical techniques. The devices and structures may have other applications, for example in building construction and associated fields.

For the correction of certain forms of deformity of the spine, it has been proposed to employ screws which have heads adapted to be crimped to a cable. The screws are screwed into selected vertebrae and one end of the cable is secured by crimping to the first of the screws. The cable is then tensioned by a requisite amount and then crimped to the screw immediately adjacent the first screw and this process is repeated until the cable has been crimped to all the screws. Such a technique is not entirely satisfactory. Once a screw has been crimped to the cable the connection cannot be released and the cable re-adjusted. This means that, if the deformity has been over-corrected at the time of crimping a particular screw, re-adjustment to full correction as opposed to over-correction is no longer possible.

The present invention provides a device for securing an elongated member to a structure, the device comprising a component having a stem which is screw-threaded for insertion into the structure and carries, at one end, a clamping assembly for releasably securing the elongated member to the component, the component and the clamping assembly each having a surface with a

groove to receive the elongated member.

Where the device is to be used for the correction of physical deformities and in surgical techniques, the stem of the component is screw-threaded in such manner that it can be screwed into bone structure. The form of the component and the screw-thread will be determined by the characteristics of the bone structure. Thus, for cortical bone, a self-tapping type shallow screw-thread of relatively small pitch is used to provide a reliable connection to the bone structure with minimal risk of damage to the latter. On the other hand, cancellous bone requires a screw of much larger diameter with a deep thread of a relatively coarse pitch.

In one embodiment of the invention, the clamping assembly is recessed, and the groove in the clamping assembly is formed on the inner face of the recess. The component has a boss which is accommodated in the recess in the clamping assembly, and the groove in the component is formed on an end face of the boss.

Preferably, the clamping assembly comprises a first member in which the groove is formed, and a clamping member by which the first member is releasably clamped on the component.

The screw-threaded stem may be integral with the boss or the latter may be separate and secured to the stem once the latter has been located in a required position. The screw-threaded stem may be formed with 'flats' to enable it to be screwed into position with socket or other form of spanner.

The elongated member may be a rod, or a cable which may be a single or multi-strand construction.

By way of example only, an embodiment of the invention suitable for use in surgical techniques will now be described in greater detail with reference to the accompanying drawings of which:-